Benchmarking SDN Controller Performance

draft-ietf-bmwg-sdn-controller-benchmark-term-00
draft-ietf-bmwg-sdn-controller-benchmark-meth-00

94th IETF, Yokohama

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Objective

- Develop a comprehensive set of tests for benchmarking SDN controllers for
  - Performance
  - Scalability
  - Reliability and
  - Security

- Define metrics and methodology to assess/evaluate SDN controllers

- Provide a standard mechanism to measure and compare the performance of various controller implementations
History

- **Revision 00**
  - Submitted in March 2014 (OpenFlow Specific)
    - (draft-bhuvan-bmwg-of-controller-benchmarking-00)
  - Presented initial version in IETF-90 meeting

- **Revision 01**
  - Submitted in October 2014 (Protocol Agnostic)
    - (draft-bhuvan-bmwg-of-controller-benchmarking-01)
  - Presented the revised version in IETF-91 meeting

- **Revision 02**
  - Submitted in March 2015 (Split into Terminology and Methodology Drafts)
    - (draft-bhuvan-bmwg-sdn-controller-benchmark-term-00)
    - (draft-bhuvan-bmwg-sdn-controller-benchmark-meth-00)
  - Presented the revised version in IETF-92 meeting

- **Revision 03**
  - Submitted in July 2015 (Addressing review comments from IETF 92 meeting)
    - (draft-bhuvan-bmwg-sdn-controller-benchmark-term-01)
    - (draft-bhuvan-bmwg-sdn-controller-benchmark-meth-01)
  - Presented the revised version in IETF-93 meeting

- **Revision 04**
  - Submitted in October 2015 (Successful Call for Adoption )
    - (draft-ietf-bmwg-sdn-controller-benchmark-term-00)
    - (draft-ietf-bmwg-sdn-controller-benchmark-meth-00)
Test Setup Overview – Standalone Mode
Test Setup Overview – Cluster Mode
## Benchmarking Tests Overview

<table>
<thead>
<tr>
<th>Category</th>
<th>Metrics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td>1. Network Topology Discovery Time</td>
<td>Time to discover a network topology - nodes and links</td>
</tr>
<tr>
<td></td>
<td>3. Asynchronous Message Processing Rate</td>
<td>Maximum number of asynchronous messages that can be processed within the test duration.</td>
</tr>
<tr>
<td></td>
<td>4. Reactive Path Provisioning Time</td>
<td>Time to setup a path reactively between src and dst</td>
</tr>
<tr>
<td></td>
<td>5. Proactive Path Provisioning Time</td>
<td>Time to setup a path proactively between src and dst</td>
</tr>
<tr>
<td></td>
<td>6. Reactive Path Provisioning Rate</td>
<td>Maximum number of independent paths setup between src and dst reactively</td>
</tr>
<tr>
<td></td>
<td>7. Proactive Path Provisioning Rate</td>
<td>Maximum number of independent paths between src and dst proactively</td>
</tr>
</tbody>
</table>
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<tr>
<td><strong>Scalability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Control Sessions Capacity</td>
<td>Max no. of control sessions be maintained</td>
</tr>
<tr>
<td></td>
<td>2. Network Discovery Size</td>
<td>Max no. of nodes, links and hosts be discovered</td>
</tr>
<tr>
<td></td>
<td>3. Forwarding Table Capacity</td>
<td>Max no. of flow entries can be managed in Forwarding table</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
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<td></td>
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<tr>
<td></td>
<td>1. Controller Failover Time</td>
<td>Time to switch from an active controller to the backup controller</td>
</tr>
<tr>
<td></td>
<td>2. Network Re-Provisioning Time</td>
<td>Time taken to re-route the traffic in alternate path.</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Exception Handling</td>
<td>Determine the effect of handling error packets and notifications</td>
</tr>
<tr>
<td></td>
<td>2. Denial of Service Handling</td>
<td>Determine the effect of handling denial of service (DoS) attacks</td>
</tr>
</tbody>
</table>
Revision 04 - Updates

- Thank you everyone for the support and feedback on this draft for successful WG adoption

- Changes Highlight

  - Clarified the SDN controller definition and scope of this memo as below.

    “For the purpose of this memo, the SDN controller is a function that manages and controls SDN nodes. Any SDN controller without a control capability is out of scope for this memo”

  - Editorial changes for better readability.
Next Steps

- Align SDN terms defined in this draft with terms that are already defined in other RFCs
- Other Comments??
Thank You!!!

The authors of

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